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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,855	10/22/2003	Masanobu Shigeta	21994-00064-US	4217
30678	7590	04/29/2005	EXAMINER	
CONNOLLY BOVE LODGE & HUTZ LLP			QI, ZHI QIANG	
SUITE 800			ART UNIT	
1990 M STREET NW			PAPER NUMBER	
WASHINGTON, DC 20036-3425			2871	

DATE MAILED: 04/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/689,855

Applicant(s)

SHIGETA ET AL.

Examiner

Mike Qi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/20/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,426,786 B1 (Lu et al).

Claims 1 and 2, Lu discloses (col.4, line 19 – col.5, line 58; col.1, line 24 – col.2, line 15; Figs.1-3) that a liquid crystal display cell and a method of forming an alignment layer of a liquid crystal display cell comprising:

- transparent substrate (1) transmitting light and solid substrate (7), i.e., a pair of bases and one base is transparent transmitting light;
- liquid crystal (8) having negative dielectric anisotropy sealed between the two substrates;
- dielectric films (3,4) function as alignment layer to align the liquid crystal director (11) of the molecules (col.4, lines 34-35; col.5, lines 6-7), and using silicon dioxide (SiO₂) (inorganic) as the target material (vapor material) (col.5, lines 46-48) to form the alignment layer on the surface of the two substrates (1, 7) facing toward the liquid crystal (8) (Fig.1);

(concerning claim 2):

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- thin film deposition system (20) (filming apparatus) used for forming an angle-deposited film to accomplish the desired alignment (col.5, lines 9-12; Fig.2), and the substrates (28) for being processed are held in the thin-film deposition system (20) (filming apparatus) and directly above the evaporation source (23) (col.5, lines 13-28);
- using Argon (inert gas) ion beam directed obliquely onto the SiO₂ film, so as to produce a surface profile change used for liquid crystal alignment, i.e., using a gas pressure of inert gas (Argon) introduced into the filming apparatus is controlled so as to control the pre-tilt angle;
- such that the inorganic alignment layer is formed by being evaporated on each surface of the pair of bases.

Lu does not explicitly disclose that the pre-tilt angle of the liquid crystal is controlled to be an angle of 3 to 10 degree, and the vapor stream material (SiO₂) of the inorganic alignment layer enter into each of the pair of bases (evaporation angle) is set to be an angle 40 to 60 degree with respect to each normal line of the pair of bases.

However, Lu discloses (col.4, line 66 – col.5, line 3) that the pre-tilt angle is controlled to within about 0.2 to about 10°. Lu discloses (col.5, lines 38 – 58) that the pre-tilt angle depends on the evaporation angle, and the pre-tilt angle is a function of evaporation angle as shown in Fig.3, and with the evaporation angle between 30° to 50° a relatively uniform pre-tilt angle is achieved.

Lu indicates (col.4, lines 60-65) that the uniformity and the magnitude of the pre-tilt angle control the display quality such as contrast ratio and display uniformity. Such that the evaporation angle to set 30 to 50 degree with respect to the normal line of the bases would control the pre-tilt angle to be uniform, and that would to be 0.2 to 10 degree so as to achieve high-quality display (col.4, line 66 – col.5, line 8) such as contrast ratio and display uniformity since the proper magnitude and uniformity of the pre-tilt angle.

The range of the pre-tilt angle of 3 to 10 degree and the range of the evaporation angle 40 to 60 degree that are overlap with the range 0.2 to 10 degree and 30 to 50 degree as being taught by Lu. In the case where the claimed ranges “overlap or lie inside range disclosed by the prior art” a prima facie case of obviousness exists. (MPEP 2144.05. I.)

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to set the vapor stream of a material (evaporation angle) at an angle of 40 to 60 degree so as to control the pre-tilt angle of the alignment at 3 to 10 degree as claimed in claims 1 and 2 for achieving the proper magnitude and uniformity of the pre-tilt angle and high-quality display such as contrast ratio and display uniformity.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi

Mike Qi
Patent Examiner
April 14, 2005